

Mr. Norris remarked that Dr. Hayes' Arctic collection contained a specimen of the common brook trout, (*Salmo fontinalis*), taken near Godhaven, Greenland; and specimens of the salmon trout, (*Salmo trutta*), common to the coasts of Scotland and new Brunswick, and the Gulf of St. Lawrence.

March 11th.

The President, Mr. LEA, in the Chair.

Thirty-two members present.

Mr. Warner made some remarks on the imitation of the section of eggs by mathematical lines.

Dr. Corse exhibited, under the microscope, specimens of Nitella, showing the circulation within the nucleole.

Dr. Carson exhibited specimens of metallic copper, deposited by voltaic action in the felt of the sunken frigates at Sebastopol.

March 18th.

The President, Mr. LEA, in the Chair.

Twenty-nine members present.

The following papers were presented for publication:

On the West African genus *Hemichromis*, etc., by Theo. Gill.

Catalogue of the Fishes of Lower California, etc., by Theo. Gill.

On some new and little known American Anura, by E. D. Cope.

March 25th.

The President, Mr. LEA, in the Chair.

Twenty-nine members present.

On report of the respective Committees, the following papers were ordered to be published in the Proceedings:

Synopsis of the Family of CIRRHITOIDS.

BY THEODORE GILL.

Family CIRRHITOIDÆ Gray.

Synonymy.

Percoidei pt. } *Cuvier, Müller, &c.*

Sciaenoides pt. }

Cirrhitoidei *Gray*, Synopsis of the contents of the British Museum.

" *Richardson.*

Theraponidæ pt. } *Richardson.*

Polynemidæ pt. }

Cirrhitoidei *Bleeker*, Acta Societatis Scientiarum Indo-Nederlandicæ, vol. ii.,
Vischsoorten von Amboina.

Cirrhitoidei *Günther*, Catalogue of the Acanthopterygian Fishes, &c., vol. ii.,
p. 70.

Sparidæ (Haplodactylina) *Günther*, op. cit., vol. i., p. 434.

The body is oblong and compressed, with the dorsal and abdominal outlines
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unequally arched. Scales cycloid and of moderate or rather large size. Lateral line simple, concurrent with the back. Head compressed, and of moderate or rather small size. Forehead nearly flat, or little convex transversely. Eyes submedian. Nostrils double, moderately approximated to each other. Suborbital bones not crossing the cheek nor articulated with the preoperculum. Preorbital bone moderate, or rather large. Preopercular, opercular, subopercular and interopercular bones normally developed. Mouth moderate, cleft on the sides. Intermaxillary bones with the ascending processes variable in development. Maxillary bones expanded towards their ends and behind the intermaxillaries at the ends. Teeth variable in form and position. Branchiostegal membrane generally extended more or less behind under the throat, and free. Branchiostegal rays normally six, rarely five and exceptionally three. Dorsal fin extending along the entire back, and with the spinous portion nearly as much or more developed than the soft. Anal fin commencing nearly under the first soft dorsal rays, and short or little oblong; spinous ray three. Caudal fin entire, or emarginated. Pectoral fins normally inserted on the sides, with the inferior rays well developed, simply articulated and not branched. Ventral fins inserted considerably behind the pectorals and with one spine and five branched rays.

The vertebral column is composed (in *Cirrhitinae*) of the normal or nearly normal number of vertebrae ($\frac{10}{16}$) or a moderately increased number (in *Latridinae*, $\frac{14}{20}$; in *Haplodactylinae*, said by Richardson to be $\frac{16}{18}$ in *Dactylosargus arcidens*.) The stomach is caecal, and a few (4 to 5) pyloric appendages are present. The air bladder is sometimes absent (most *Cirrhitinae* and *Chironematinae*); or present and simple (most *Haplodactylinae*); or lobed or fringed (most *Latridinae*.)

This family is a very distinct and perhaps a natural one, although its several groups or subfamilies offer rather peculiar characters and decided variations. The chief characters by which those various groups are united, are the position of the ventral fins very considerably behind the bases of the pectoral, and the simple, thickened and produced rays of the pectoral fins; the branchiostegal membrane is also generally more ample beneath than in those forms which most resemble the Cirrhitoids in external appearance. In the artificial arrangement of Cuvier and his disciples, in which the fishes with the typical or percoid form were arranged according to the presence or absence of palatal teeth and of opercular armature, the members of the present family were partly referred to the Percoids and partly to the Sciaenoids, with which they have very little affinity. Dr. Gray appears to have been the first to propose the family which Sir John Richardson was afterwards inclined to adopt, although in his essay on "Ichthyology," in the Encyclopædia Britannica, he has referred *Cirrhitæ*, *Aplodactylus* and *Chironemus* as the first of the genera, to his family of Theraponidæ, which family certainly is, as he admits, "a rather heterogeneous assemblage of Percoids, brought together by the single character of six branchiostegals." The other genera, *Cheilodactylus* and *Latris*, are placed by him after *Polynemus*, and constitute with it his family of Polynemidæ.

Dr. Bleeker has adopted the family of "Cirrhitoidæ," and divided it into three subfamilies,—Cirrhitiformes, Haplodactyliformes and Cheilodactyliformes. *Chironemus* has been once placed in the first subfamily, and again, as *Threperius* of Richardson, in the third, Bleeker not having perceived their affinity to each other.

Dr. Günther has a family of "Cirrhitidæ," which is naturally constituted, but he has placed the *Haplodactylus* in a peculiar "group" or subfamily among the Sparidæ, to which it has apparently little true affinity.

The Cirrhitoids, so far as known, are peculiar to the torrid and temperate portions of the Pacific Ocean and its indentations. The *Cirrhitinae* are principally 1862.]

pally tropical, and chiefly developed in the Indian seas and those of the great archipelago, from which some wander to the Pacific, Chinese and African seas, and one (*Cirrhitus maculatus*) ranges to the Red Sea, where, indeed, it appears to be most common. Another (*Cirrhitus rivulatus* Val.) is found at both the Gallapagos Islands and Lower California, it having been observed at the latter place by Mr. Xantus.* The *Chironematinæ* are peculiar to the Australian Seas. The *Haplodactylinæ* and *Latridinæ* are principally inhabitants of the Southern temperate seas, and most numerous in the Chilian and Peruvian and the Australasian seas. Several are also found at the Cape of Good Hope, while several others are northern and inhabitants of the Chinese and Japanese waters.

The following synopsis will enable one to readily distinguish the different subfamilies:

Synopsis.

- I. Spinous portion of the dorsal longest, but with only 10 (9) spines. Vertebræ $\frac{10}{16}$Cirrhitinæ.
- II. Spinous portion of the dorsal more or less subequal to the soft, with 14—22 spines.
 - A. Teeth of jaws compressed and tricuspidate or lanceolate.
 - Vertebræ $\frac{10+x}{14+y}$Haplodactylinæ.
 - AA. Teeth small, conic and acute.
 - B. Ventral fins (generally) rounded; caudal subtruncated; dorsal deeply notched behind each spine.....Chironematinæ.
 - BB. Ventral fins angulated; caudal with extended lobes; dorsal not notched behind each separate spine. Vertebræ $\frac{14}{20}$Latridinæ.

I have not been enabled to examine many of the species of the family, but I trust that the suggestions and views enunciated in this treatise will forward the classification and knowledge of the group, and prove useful to naturalists if it should only direct attention to the imperfect knowledge we have of some forms. Several of the species have been so described that it has not been possible to positively refer them to any group. The whole family, indeed, requires a careful revision, and the present classification will be doubtless considerably modified.

Subfamily CIRRHITINÆ Gill.

Cirrhitæformes pp., Bleeker.

Teeth conical and mostly small, but often with larger or canine ones intermixed. Dorsal fin with its spinous portion longer than the soft, and with ten spines, the last of which truly belongs to the second portion. Ventral fins generally angulated or subangulated, the second (branched) ray being rarely somewhat longest. Caudal fin truncated or emarginated. The vertebral column, in all the species examined, has been found to be constituted of ten abdominal and sixteen caudal vertebræ.

The Cirrhitinæ as defined above form a natural group, and differ from the Cirrhitæformes of Bleeker by the exclusion of *Chironemus*, which appears to represent a distinct subfamily.

*Another species not yet described is found at Cape St. Lucas. It had been unfortunately overlooked until after the transmission of the above paper; it will be described in the catalogue of the Fishes of Lower California.

Synopsis.

Spinous portion of dorsal longest, but with only 9 or 10 rays.

Vertebrae about $\frac{10}{16}$ CIRRHITINÆ.

a. Head abbreviated, with the jaws not produced.

Head decurved from the nape; operculum unarmed.

Origin of dorsal nearly over preopercular margin.

Canine teeth obsolescent..... Amblycirrhitus.

Origin of dorsal generally above carpus; canine

teeth in both jaws.... Cirrhitus.

Head very obliquely incurved to the pointed snout. Operculum with two small spines.....Cirrhitichthys.

Preorbital not higher than the eye's diameter.Cirrhitichthys.

Preorbital considerably higher than an eye's diameter.....Cirrhitopsis.

β. Head oblong and incurved to the snout; intermaxillary produced, and with the posterior processes toothed..Oxyccirrhitus.

AMBLYCIRRHITUS Gill.

Synonymy.

Cirrhitus sp. *Cuv. et Val.*

Rostrum convexum. Dentes canini obsolescentes. *Pinna dorsalis fere supra preoperculi marginem incipiens.*

Body oblong-cuneiform, highest before the ventral fins, before which it is rapidly curved upwards. Scales large. Head short and elevated, higher than long. Occipito-nasal outline very oblique and nearly straight; snout slightly convex. Nape gibbous. Preoperculum finely serrated behind. Mouth little oblique and of moderate size, chiefly under the eyes. Teeth pluriserial, with the canine obsolete or rudimentary. Branchiostegal rays 6, 6. Dorsal fin commencing at the nape above the preoperculum; its spinous portion is convex, much lower behind than the articulated, and the membrane is very profoundly notched and produced into a slender lobe behind each spine. Anal fin with three spines, the second of which is largest, and with six branched rays. Caudal fin entire, with its angles acute. Pectoral fins with its undivided rays slightly produced.

Type. Amblycirrhitus fasciatus Gill.

The *Cirrhitus fasciatus* of the "Histoire Naturelle des Poissons" differs from the typical *Cirrhitus* by the form of the body, the region of greatest height being before the ventral fins and not above it, as in the latter; by the resultant more anterior commencement of the dorsal fin, and the deeply-notched and lobigerous membrane behind the spines of that fin, and by the absence of larger canine teeth.

Only one species of the genus is known.

AMBLYCIRRHITUS FASCIATUS, Gill.

Cirrhitus fasciatus *Cuv. et Val.*, Histoire Naturelle des Poissons, tom. iii., p. 76, pl. 47.

Habitat. East Indian seas, (Pondicherry.)

CIRRHITUS (Commerson) Lac.

Synonymy.

Cirrhitus (*Comm.*) *Lacépède*, Histoire Naturelle des Poissons, tom. v., p. 2, 1803.

Rostrum convexum. Dentes canini antici in maxilla superiore 2. *Pinna dorsalis supra pinnæ pectoralis basiu incipiens.*

Body oblong-oval, highest before or above the ventral fins, covered with 1862.]

rather large scales. Head moderate, and generally longer than high. Occipito-nasal profile obliquely and moderately decurved. Nape convex. Eyes moderate, above the rostro-opercular line and submedian. Preoperculum more or less serrated behind, rarely entire. Anterior nostrils generally with short fimbriated tubes. Mouth oblique and of moderate size; the supramaxillary bones generally end under the eyes. Teeth pluriserial, margined by an external row of larger ones; canine teeth generally present on each jaw, in the upper in front, and in the lower on the sides. Front of vomer furnished with a row of small teeth. Branchiostegal rays six on each side. Dorsal fin furnished with ten spines and ten to twelve (rarely fourteen) rays, the former of which form nearly two-thirds of its length; the spinous portion is convex at the middle and behind much lower than the soft portion; the membrane is moderately notched behind each spine. Anal fin with three strong spines, the second of which is largest, and six branched rays. Caudal fin generally entire and abruptly truncated. Pectoral fins with the simply articulated rays moderately produced.

Type. *Cirrhitus maculatus* Lacépède.

The species retained in the genus *Cirrhitus* as now limited, appear to have the same physiognomy and to bear a strong resemblance to each other; but the *Cirrhitus maculatus*, which was the only species of the genus known to its founder, has a small patch of teeth on the anterior portion of each palatine bone, while in all the others the teeth are confined to the front of the vomer. For this reason Drs. Bleeker and Günther have referred that species, although the type of *Cirrhitus*, to the genus *Cirrhitichthys*, established by the former naturalist for fishes differing from *Cirrhitus* by the presence of palatine teeth. As the *Cirrhitinæ* with unarmed palatine bones do not appear to differ in any other respect from the *Cirrhitus maculatus*, and as the dentigerous palatine area is very small, we retain the species having the same specialized resemblance in the genus.

Cirrhitichthys is apparently an excellent genus, and is consequently retained, but with quite different limits and on other grounds than those for which it has been distinguished by Bleeker and Günther. As before mentioned, it was separated by them from *Cirrhitus* on account of the presence of palatine teeth. The most essential character appears to us to be the form of the head.

Nine species of the genus are now known.

Palatine bones with teeth anteriorly.....*C. marmoratus*.
Palatine bones unarmed.

Preoperculum denticulated.

Dorsal IX. I. 10, 11.

Body not transversely banded. 7 simple pectoral rays.

Pectoral thickened, not extending beyond the anus.

Scales of the lateral line 40.....*C. alternatus*.*

Scales of lateral line 48—50.

Head simply dotted with black.....*C. Fosteri*.

Head with a margined area behind the eyes.

Area marked by a whitish semicircular line, edged with brownish; sides above lateral line with a longitudinal whitish band..*C. arcatus*.

Area brown, bounded by yellow; sides with many (16) longitudinal lines.....*C. amblycephalus*.

C. alternatus has five indistinct, oblique, purple bands, the first of which alternate below the lateral line with their lower halves, while the last is continuous. But, as it has seven simple pectoral rays, and is closely allied to *C. marmoratus* and *C. Fosteri*, it is placed between them.

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Pectoral thickened ray extending to the
 origin of the anal; scales of lateral
 line 42.....*C. punctatus*.
 Body (red) with 6 vertical blackish bands; 6
 simple pectoral rays.....*C. aprinus*.
 Dorsal IX. I. 13. Scales 49.....*C. fasciatus*.
 Preoperculum entire.....*C. rivulatus*.

1. *CIRRHITUS MARMORATUS* Gill.

Labrus marmoratus *Lac.*, Hist. Nat. des Poissons, tome iii., p. 492, pl. 5,
 fig. 3.

Cirrhitus maculatus *Lac.*, op. cit., tome v., p. 3.

Cirrhitus maculosus *Bennett*, Zoological Journal, 1829, pl. 38.

Cirrhitichthys maculatus *Bleeker*.

Habitat. Red Sea, Southern Asia, Indian Archipelago, Isle of France and
 Polynesia.

2. *CIRRHITUS ALTERNATUS* Gill.

Habitat. Sandwich Islands.

3. *CIRRHITUS FORSTERI* Günther.

Perca tæniata *Forster*.

Grammistes Forsteri *Bloch*, Systema Ichthyologiæ, Schneid. ed., p. 191.

Sparus pantherinus *Lac.*, Hist. Nat. des Poissons, tome iv., p. 100.

Cirrhitus pantherinus *Cuv. et Val.*, tome iii., p. 70.

Serranus Tankervilleæ *Bennett*, Fishes of Ceylon, pl. 27.

Cirrhitus Forsteri *Günther*, Catalogue of the Acanthopterygian Fishes, &c.,
 p. 71.

Habitat. Cape seas, Eastern Africa, Southern Asia and Indian Archipelago.

4. *CIRRHITUS ARCATUS* *Cuv. et Val.*

Cirrhitus arcatus *Cuv. et Val.*, tome iii., p. 74.

Cirrhitus vittatus *Val.* in *Cuv.* Regne Animal, ed. ill. Poissons, pl. 39.

Habitat. Mauritius, Southern Asia, Indian Archipelago, and Sandwich
 Islands.

5. *CIRRHITUS AMBLYCEPHALUS* *Bleeker*.

Cirrhitus amblycephalus *Bleeker*, Natuurkundig Tijdschrift voor Neder-
 landsch Indie, vol. xii., p. 378.

Habitat. Sangi.

6. *CIRRHITUS PUNCTATUS* *Cuv. et Val.*

Cirrhitus punctatus *Cuv. et Val.*, tome iii., p. 70.

Habitat. Indian Ocean.

7. *CIRRHITUS APRINUS* *Cuv. et Val.*

Cirrhitus aprinus *Cuv. et Val.*, tome iii., p. 76.

Habitat. Sea of Timor.

8. *CIRRHITUS FASCIATUS* *Bennett*.

Cirrhitus fasciatus *Bennett*, Zoological Journal, 1829, p. 39.

Cirrhitus cinctus *Günther*, Catalogue of the Acanthopterygian Fishes, vol.
 ii., p. 73.

Not *Cirrhitus fasciatus* *Cuv. et Val.* (= *Amblycirrhitus fasciatus* Gill.)

Habitat. Madagascar, Isle of France and Sandwich Islands.

9. *CIRRHITUS RIVULATUS* *Val.*

Cirrhitus rivulatus *Val.*, Voyage de la Vénus, Poissons, p. 309, pl. 3, fig. 1.

Habitat. Galapagos Islands and Lower California.

1862.]

CIRRHITICHTHYS Bleeker.

Synonymy.

Cirrhitichthys Bleeker, *Natuurkundig Tijdschrift voor Nederlandsch Indie*, vol. x., (Index,) p. 474, 1856.

Cirrhitichthys sp. *Temminck et Schlegel*, *Bleeker*.

Rostrum acutum. *Dentes canini in maxilla superiori nulli; dentes palatini.*

Body oblong-ovate, highest above the ventral fins, and covered with rather large scales. Head moderate, and nearly equally long and high. Nape and crown convex. Occipito-nasal outline obliquely concave and incurved towards the pointed snout; pectori-nasal outline curved upwards. Crown and forehead scaly; suborbital bones naked. Preoperculum finely serrated behind. Suborbital bone entire, or dentated posteriorly. Operculum armed with two minute spines. Nasal cirrhi fringed. Mouth oblique and rather small; supramaxillary bones ending under or nearly under the anterior borders of the orbits. Teeth pluriserial, larger in the external row; in the lower jaw on each side are larger canine teeth. Front of vomer and palatine bones armed with a band of villiform teeth. Branchiostegal rays 6—6. Dorsal fin with its spinous part convex, and the last ray generally longer than the penultimate. The interspinous membrane is simply notched, or produced in penicilligerous lobes behind each spine. The first articulated ray is more or less elongated. Anal fin with three spines, the second of which is very stout, and six or seven branched rays. Caudal fin subtruncated.

Type. *Cirrhitichthys graphidopterus Bleeker.*

Under the name of *Cirrhitichthys*, Dr. Bleeker has collected together several fishes which appear to have a considerable mutual resemblance, and to decidedly differ from *Cirrhitichthys*, to which genus most of them had been previously referred. Four species have been placed in the genus which appear to concur in having the same physiognomy, but are distinguished from each other by some very decided characteristics. Three have a nearly similar size and position of the eye, which is separated about a diameter, or even less, from the end of the snout. A fourth has smaller eyes, much more distant from the snout. Of the first three, one has a distinctly serrated preorbital, while in the other two it is entire; the latter again are distinguished by the condition of the interspinous portion of the dorsal fin.

The following analytical synopsis will more readily show the relative differences:

Snout shorter than the eye; suborbital bone scaleless.

Preorbital serrated behind..... *C. graphidopterus*.

Preorbital entire behind.

Interspinous membrane penicilligerous..... *C. oxyrhynchus*.

Interspinous membrane not penicilligerous..... *C. oxycephalus*.

Snout longer than the eye; suborbital bone scaly..... *C. aureus*.

In the preceding table the categories have been arranged in the order which appears to best express their value. The most distinct groups or natural sections seem to be those characterized by the size of the eyes and their position. Many naturalists, confiding in characters which may be of very little real value, although at the same time trenchant and well defined, would regard the dentated or entire posterior margin of the preorbital bones as a character of greater value; and some would doubtless even consider it as entitled to generic rank. But, after a careful comparison of the descriptions of the various species that have hitherto been made known, we cannot discover that there is any other essential character by which *Cirrhitichthys graphidopterus* is distinguished from *C. oxyrhynchus* and *C. oxycephalus*. There appearing, then, to be no differences coincident with the condition of the preorbital margin, and the physi-

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ogonomy being apparently similar, one cannot be disposed to regard such a character in this case as generic.

The *Cirrhitus aureus* of Temminck and Schlegel is probably the type of a distinct genus. We have provisionally proposed for it the designation of *Cirrhitopsis*, but having seen none of the species of Bleeker's *Cirrhitichthys*, hesitate to rank it as a genus.

The *Cirrhitus maculatus* of Lacépède has been referred to *Cirrhitichthys* by Dr. Günther, as well as Dr. Bleeker, on account of the presence of "a very small patch of teeth anteriorly on each palatine bone." In other respects, that species perfectly agrees with most of the species retained under the name of *Cirrhitus* by those gentlemen. Its physiognomy is entirely similar to theirs, and quite different from that of a typical *Cirrhitichthys*. We therefore retain that species in the genus *Cirrhitus*, not regarding the extension of a few of the teeth on the palatine bones as entitling it to generic distinction, and certainly not to be grouped with *Cirrhitichthys*. The name *Cirrhitichthys* could in no case be accepted for the *Cirrhitus maculatus*, as it is the type and only species placed by Commerson and Lacépède in their genus; it must therefore always retain that name, and if isolated from others, they must receive a new generic appellation, and not it.

Subgenus CIRRHITICHTHYS.

1. CIRRHITICHTHYS GRAPHIDOPTERUS Bleeker.

Cirrhitichthys graphidopterus Bleeker, *Natuurkundig Tijdschrift voor Nederlandsch Indie*, 1853, p. 106.

Habitat. Amboyna.

2. CIRRHITICHTHYS OXYRHYNCHUS Bleeker.

Cirrhitichthys oxyrhynchus Bleeker, *Natuurkundig Tijdschrift voor Nederlandsch Indie*, deel xv., 1858, p. 203.

Habitat. Goram.

3. CIRRHITICHTHYS OXYCEPHALUS Bleeker.

Cirrhitichthys oxycephalus Bleeker, *Natuurkundig Tijdschrift voor Nederlandsch Indie*, deel viii., 1855, p. 408.

Habitat. Amboyna.

Subgenus CIRRHITOPSIS.

4. CIRRHITOPSIS AUREUS Gill.

Cirrhites aureus Temm. et Schlegel, *Fauna Japonica, Pisces*, p. 15, pl. 7. fig. 2.
Cirrhitichthys aureus Bleeker.

Habitat. Japan and China.

OXYCIRRHITES Bleeker.

Synonymy.

Oxycirrhites Bleeker, *Achtste Bijdrage tot de kennis der Vischfauna van Amboyna*, p. 39; in *Acta Societatis Indo-Nederlandicæ*, vol. ii., 1856—7.

Rostrum acutissimum, productum. Dentes canini nulli.

Body elongated, compressed and about five times as long as high. Scales large. Head very acute, nearly twice as long as high, with the nape convex; concave between the occiput and snout. Cheeks and opercular bones scaly. Preoperculum dentated, and with its angle obtusely rounded. Operculum armed with a flat spine. Anterior nostrils each furnished with a divided cirrus. Mouth almost prolonged into a tube. Jaws equal; the upper produced more than an eye's diameter beyond the snout, dentated on their ascending and descending branches. Teeth pluriserial on each jaw, preceded by a row of larger ones, but no canines. Front of the vomer with a semilunar band of small ones; palatine none. Branchiostegal rays 6—6. Dorsal fin with ten spines, the third, fourth and fifth of which are longest, and the first and penultimate shortest; 1862.]

soft portion acute and elevated in front, low and rounded behind. Anal fin with three spines, the second of which is elongated; soft portion rounded before and behind, and with seven or eight rays. Caudal fin emarginated and with pointed lobes. Pectoral fins irregularly rhomboidal, and with none of its entire rays produced.

Type. *Oxycirrhites typus* Bleeker.

This genus is almost peculiar among fishes by the extension of the intermaxillary bones and the armature of their ascending branches. It also differs from *Cirrhitichthys* and *Cirrhitus* by the more elongated body and head, and the form of the caudal.

A single species is known.

OXYCIRRHITES TYPUS Bleeker.

Oxycirrhites typus Bleeker, Achtste Bijdrage tot de kennis der Vischfauna von Amboine, p. 40, in Acta Societatis Indo-Nederlandicæ, vol. ii.

Habitat. Amboyna and Isle de France.

Subfamily HAPLODACTYLINÆ Günther.

Haplodactyliformes Bleeker.

Haplodactylina Günther, Catalogue of the Acanthopterygian Fishes, &c., vol. ii., p. 434.

Teeth compressed, trenchant and lanceolate, or tricuspidate. Dorsal fin nearly equally divided into spinous and soft; the former with fourteen to seventeen spines. Ventral fins generally with the second branched ray longest. Caudal fin truncated or emarginated.

The vertebral column is composed of an increased number of vertebrae, Richardson having found sixteen abdominal and eighteen caudal ones in the *Dactylosargus arcidens*. Günther, however, adopts the correctness of that number.

This subfamily is distinguished principally by the dentition; the physiognomy of its representatives is also rather peculiar. The group is divisible among three genera, which may be thus distinguished.

Teeth of jaws *compressed*, tricuspidate or lanceolate.

Vertebrae $\frac{10+x}{14+y}$ HAPLODACTYLINÆ.

Vomerine teeth present.

Teeth in both jaws tricuspid Haplodactylus.

Teeth in both jaws sublanceolate, or with lateral

lobes small *Dactylosargus*.

Vomerine teeth obsolete. Teeth tricuspid in jaws... *Crinodus*.

HAPLODACTYLUS Cuv. et Val.

Synonymy.

Aplodactylus Cuv. et Val. Histoire Naturelle des Poissons, vol. viii., p. 476, 1831.

Aplodactylus Guichenot.

Haplodactylus Günther, Catalogue of the Acanthopterygian Fishes, &c., vol. ii., p. 434.

Dentes tricuspidati et velutinæ in maxillis ambobis; in maxilla superiori tricuspidati, triseriati; inferiori biseriati. *Dentes* vomerini velutini.

Body oblong, highest above or behind the ventral fins, covered with small scales. Head scarcely longer than high, with the profile behind the eyes obliquely straight or little concave, before eyes very oblique and high. Eyes high and mostly anterior. Preorbital bones higher than long. Preoperculum with an entire membranous border.

Mouth small, transverse and terminal. Teeth villiform or cardiform in each

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jaw, preceded in the upper by three rows of tricuspidate teeth, and in the lower by two rows. The tricuspidate teeth have the cusps rounded, and the median longest. Front of vomer with villiform teeth. Anterior dorsal fin convex, declining in a straight line behind and with fifteen or sixteen spines, the last of which are very short. Anal fin with three spines, the first two of which are very short, and with seven or eight branched rays, which very rapidly diminish in size.

Type. *Haplodactylus punctatus* Cuv. et Val.

The genus *Haplodactylus*, as here defined, has the same limits given to it by Cuvier and Valenciennes and by Guichenot. Two species that have since been referred to it by Sir John Richardson and Dr. Günther, have been abstracted from it, and are considered to be the types of as many distinct genera. The diagnosis given by Dr. Günther to *Haplodactylus* is indeed equivalent to ours, but his *Haplodactylus arctidens* and *H. lophodon* do not correspond to his definition. The correctness of the elimination of these two species is confirmed by their geographical distribution. The typical *Haplodactyli* are, as far as known, peculiar to the temperate salt waters of western South America. The other two species are inhabitants of the Australian seas.

Four forms have been described as distinct, but the specific differences of all of them have not yet been fully demonstrated. Dr. Günther has united the *Haplodactylus punctatus* and *H. reginæ*, but, if the figure of the latter is correct, it is apparently a very good species. The species appear to be distinguished by the following characters; but it will be necessary to confirm them, and they must be accepted with reserve:

Secondary color or markings dark.

1. Body brownish gray, covered with irregular, brown vermiculated markings; fins thickly spotted. A. III. 8. *H. vermiculatus*.
2. Body brownish red above, irregularly dotted with black. A. III. 8; first three dorsal spines short and graduated, much shorter than the fourth?.....*H. reginæ*.
3. Body brownish above, dotted all over with blackish. A. III. 7; first four dorsal spines regularly graduated to the fifth.*H. punctatus*.

Spots or dots whitish, on a yellowish ground. A. III. 7.....*H. guttatus*.

1. *HAPLODACTYLUS PUNCTATUS* Cuv. et Val., Günther.

Aplodactylus punctatus Cuv. et Val., Hist. Nat. des Poissons, tome viii., p. 477, pl. 242.

Habitat. Chili.

2. *HAPLODACTYLUS REGINÆ* Val.

Aplodactylus reginæ (Val.) Gray, Historia Fisica y politica de Chile, Zoologia, tomo ii., p. 158, lam. 1, fig. 2.

Haplodactylus punctatus p. Günther, Catalogue of the Acanthopterygian Fishes, vol. ii., p. 434.

Habitat. Chili.

3. *HAPLODACTYLUS VERMICULATUS* Gay, Günther.

Aplodactylus vermiculatus Gay, Op. cit. tomo ii., p. 159, lam. 1, fig. 1.

Habitat. Chili (Valparaiso.)

4. *HAPLODACTYLUS GUTTATUS* Gay, Günther.

Aplodactylus guttatus Gay, Op. cit., tomo ii., p. 160.

Habitat. Chili.

DACTYLOSARGUS Gill.

Synonymy.

Aplodactylus sp. Richardson.

Haplodactylus sp. Günther.

1862.]

Dentes omnes in maxillis tricuspidati, vel lanceolati, lobis externis parvis, in seriebus externis majores. Dentes vomerini velutini.

Body oblong, highest above or behind the ventral fins, covered with small scales. Head scarcely longer than high, with the profile behind the eyes obliquely straight, or little concave, and in front very oblique. Preorbital bones as high or higher than long. Eyes elevated and mostly anterior. Preoperculum with an entire membranous border. Mouth small, transverse and terminal. Teeth in the old, narrow, thin and little cuspidate, arranged in a band on each jaw; the teeth of outer rows are largest. Front of vomer with a small patch of villiform teeth slightly extending on the palatine bones. Branchiostegal rays six on each side. Dorsal fin convex and with sixteen spines, the last of which are small. Anal fin with three spines and eight branched rays.

This genus is nearly allied to the genuine *Haplodactylus*, but is distinguished by the trilobation of all the teeth, and not only the large ones of the external rows as in *Haplodactylus*. One species has been well described, and perhaps another indicated.

DACTYLOSARGUS ARCTIDENS Gill.

Aplodactylus arctidens Richardson, Proc. Zoological Society of London, 1839, p. 96.

Habitat. Port Arthur.

The following species is referred to the genus *Dactylosargus* with doubt, being only known through the description of Parkinson:

DACTYLOSARGUS MEANDRATUS Gill.

Sciæna meandrata Parkinson MSS.

Aplodactylus meandratus Richardson, Transactions of the Zoological Society, vol. iii., p. 83.

Habitat. New Zealand.

CRINODUS Gill.

Synonymy.

Haplodactylus sp. *Günther.*

Dentes tricuspidati in maxilla superiori pluriseriati, uniseriati in inferiori. Vomer inermis.

Body oblong, highest above or behind the ventral fins, covered with rather small scales. Head little longer than high, with the forehead flattened, and the snout obtusely rounded and projecting. Eyes elevated and mostly anterior. Preoperculum entire and with a membranous margin. Mouth narrow, horizontal, and situated beneath the snout. Teeth elongated and tricuspidate, with the terminal lobe largest, arranged in a band on the upper jaw, and uniserial on the lower: palate unarmed. Branchiostegal rays five on each side. Dorsal fin with its spinous portion convex, and with about seventeen spines, the last of which are short. Anal with three graduated spines and six branched rays.

Crinodus appears to be decidedly different from either *Haplodactylus* or *Arctidens*, the snout being more protuberant, the teeth of the lower jaw confined to one row, and only five branchiostegal rays being present on each side.

This also is represented by a single known species.

CRINODUS LOPHODON Gill.

Haplodactylus lophodon *Günther*, Catalogue of the Acanthopterygian Fishes, &c., vol. ii., p. 435.

Habitat. Coast of New South Wales.

Subfamily CHIRONENEMATINÆ Gill.

Teeth acutely conical and small. Dorsal fin with its spinous portion generally more or less longer than the soft, and with thirteen to fifteen spines, the

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membrane behind each of which is deeply and acutely notched. Ventral generally obtuse or rounded. Caudal fin truncated or subtruncated.

Chironemus appears to be entitled to take rank as the type of a distinct group of Cirrhitoids, its physiognomy being quite different from that of any other division; the characters above given are sufficient to distinguish it, and they will doubtless be found to be accompanied by others of more importance when the family shall have been fully investigated.

CHIRONEMUS Cuv. et Val.

Synonymy.

Chironemus Cuv. et Val., Histoire Naturelle des Poissons, vol. iii., p. 78.

Threpterus Richardson, Proc. Zoological Society of London, 1850, p. 68; *ib.* in Annals and Magazine of Natural History, vol. vii., p. 284, 1851.

Chironemus Günther, Catalogue of the Acanthopterygian Fishes, &c., vol. ii., p. 76.

Body oblong, highest above or before the ventral fins. Scales rather large. Head moderate, subconical and longer than high. Occipito-nasal profile nearly straight; snout scarcely convex. Crown, forehead and cheeks naked. Operculum, suboperculum and interoperculum scaly. Preoperculum entire, nearly vertical or slightly oblique behind and rounded at its angle; operculum with two spines. Eyes anterior. Suborbital bones narrow. Anterior nostrils with a membranous appendage. Mouth oblique, moderate. Supramaxillary bones ending near the vertical of the anterior borders of the orbits. Teeth generally villiform, in a band on each jaw and on the front of the vomer. Branchiostegal rays 6, 6. Dorsal fin commencing above or little before the bases of the pectorals, with its spinous portion longer than the soft, convex and with fourteen or fifteen spines, the penultimate of which is lower than the soft portion; its membrane is deeply notched behind each spine. Anal fin short, with three spines and six or seven branched rays. Caudal fin entire or convex. Pectoral fins with its inferior simple rays produced, and the intervening membrane deeply notched.

Type. *Chironemus georgianus Cuv. et Val.*

With Dr. Günther, we have, for the present, retained the *Threpterus maculosus* of Sir John Richardson and the *Chironemus marmoratus* of the former gentleman in this genus to which both have been referred. It is quite probable, however, that the genus may be hereafter found not to be homogenous, and that *Threpterus* may be re-established, but with quite different characters from those assigned to it by its founder, who named it from a misconception of its true relations, and did not perceive its affinity to the Cuvieran *Chironemi*.

The principal distinctive characters of the three species combined under this generic designation are as follows:

Second simple pectoral ray produced to the anal; soft dorsal half as long as spinous.....	C. georgianus.
None of the pectoral rays much produced beyond others.	
Teeth of jaws nearly uniserial: soft dorsal two thirds as long as spinous.....	C. maculosus.
Teeth of jaws villiform, in a broad band; soft dorsal rather shorter than spinous.....	C. marmoratus.

Not having been able to examine any of the species of the genus, we are not prepared to state what may be the value of those characters, or whether they are entitled to be regarded as more than specific. The type of the genus is very imperfectly known, having been only described by Cuvier and Valenciennes from a much injured specimen.

The three species are confined to the Australian seas.

1. *CHIRONEMUS GEORGIANUS*, Cuv. et Val.
Chironemus georgianus Cuv. et Val. Hist. Nat. de Poissons, tome iii., p. 78.
Habitat. King George's Sound.
2. *CHIRONEMUS MACULOSUS*, Günther.
Threpterus maculosus Richardson, Proc. Zoological Society, 1850, p. 70,
 pl. 2, figs. 1, 2,
Habitat. King George's Sound.
3. *CHIRONEMUS MARMORATUS*, Günther.
Chironemus marmoratus Günther, Catalogue of Acanthopterygian Fishes,
 vol. ii., p. 76.
Habitat. Western coast of Australia.

Subfamily LATRIDINÆ Gill.

Teeth acutely conical and generally small. Dorsal fin with its spinous and soft portions subequal or one not much longer than the other; the spinous portion has from fifteen to twenty-three spines, behind which the membrane is notched. Ventral fins generally acutely angulated, the first branched ray being the longest. Caudal fin with the angles more or less obliquely produced and acute or rounded. The vertebral column is composed of a moderately increased number of vertebræ, all those examined having fourteen abdominal and twenty caudal.

This subfamily appears to be a very natural one, all the species having the same general physiognomy, and equally differing from the representatives of the other groups of Cirrhitoids. The genera are rather numerous; their principal distinctive characters are given in the following synopsis. Several species have been retained provisionally in genera to which they apparently do not belong,—the descriptions alone of their several describers not being sufficiently characteristic to enable one to positively allocate them.

Ventral fins angulated, the first branched ray being longest;

caudal with its lobes produced; dorsal not acutely
 notched behind each spine. LATRIDINÆ.

I. Branchiostegal rays 5 or 6.....LATRIDES.

A. Anal fin nearly coterminous with dorsal, and with
 more than 30 rays.

Vomerine teeth.....Latris.

Vomerine teeth obsolete.....Latridopsis.

AA. Anal fin with 30 branched rays or less.

B. Teeth only in the upper jaw.....Mendosoma.

BB. Teeth in both jaws.

C. Spinous dorsal convex or arched.

D. Branchiostegal rays VI.

1. Head high and much decurved. Anal
 oblong and nearly uniformly high...Dactylopagrus.

2. Head conic. Anal oblong. Dorsal
 and anal spines robust.....Acantholatis.

3. Head conic. Anal short, produced
 at its anterior angle, and when ex-
 panded with the rayed margin ver-
 tically truncated or emarginated...Chirodactylus.

DD. Branchiostegal rays V. Scales small
 (L. l. 75.).....Chilodactylus.

CC. Spinous dorsal elevated in front, preceded
 by three graduated spines and obliquely
 incurved behindGoniistius.

II. Branchiostegal rays III.....NEMATODACTYLI.

Teeth of jaws uniserial.....Nematodactylus.

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LATRIDOPSIS Gill.

*Synonymy.**Latris Richardson.**Cheilodactylus* sp. *Richardson.**Pinna analis* dorsali coterminalis, radii 30 plusve. *Palatum* edentulum.

Body subfusiform, highest above the ventral fins; caudal peduncle slender. Scales of moderate size. Head compressed, short and conical in profile, with the occipito-nasal outline straight. Eyes moderate, above the rostrum-opercular line, submedian and remote from the snout. Scales on the head above and laterally. Preoperculum vertical behind. Mouth small. Teeth only the jaws, where they are small and pluriserial in front. Branchiostegal rays 6—6. Dorsal fin nearly equally divided; the anterior portion convex and with about seventeen spines, the last of which are very low. Anal fin long, with three small spines and about thirty or more rays, coterminal with the soft dorsal. Pectoral fins rounded and with its simple rays not produced.

Type. *Latridopsis ciliaris* Gill.*Syn.* *Latris ciliaris* *Richardson.*

The present genus and *Latris* are pre-eminently distinguished from all the other members of this family by the many-rayed anal fin, which is quite long and coterminal with the dorsal fin. The physiognomy is also quite dissimilar to that of other Latridinæ, and would itself sufficiently distinguish them. The only difference from *Latris* appears to be the absence of teeth on the front of the vomer. As this is unaccompanied by any other modification of importance, it may be urged that, as in the case of *Cirrhitus*, the two might be combined. The absolute presence or absence of teeth on the palate appears, however, to be of greater value than the slight extension of a patch on neighboring bones, and we have therefore considered the absence of the vomerine teeth as a character which generically distinguishes the *Latris ciliaris* from the type of that genus. The dentition of the present genera does not appear to have any analogy to that of the Theraponoids, where the presence or absence of palatine teeth appears to be dependent on age, the teeth being deciduous.

LATRIDOPSIS CILIARIS Gill.

Anthias ciliaris Bloch, *Systema Ichthyologiæ*, *Sehneid.* ed., p. 310.*Sciæna ciliaris* *Forster.**Latris ciliaris* *Richardson.**Habitat.* New Zealand.

LATRIS Richardson.

*Synonymy.**Latris Richardson*, *Transactions of the Zoological Society of London*, vol. iii., p. 106.*Chilodactylus* *Richardson.**Pinna analis* dorsali coterminalis, radii 25 plusve. *Dentes* vomerini.

Body subfusiform, highest at the ventral fins. Scales of moderate size. Head compressed, short and conical laterally, with the occipito-nasal profile nearly straight. Eyes moderate, above the rostrum-opercular line, submedian and remote from the snout. Scales on the superior surface and the sides. Preoperculum vertical behind. Mouth small. Teeth present on the jaws and front of vomer; pluriserial at the symphysis. Branchiostegal rays 6—6. Dorsal fin nearly equally divided into spinous and articulated; the former is convex and has about seventeen spines, the last of which become very low. Anal fin long and coterminal with articulated portion of the dorsal, provided with three small spines and thirty or more rays. Pectoral fin with none of its simply articulated rays produced.

One species of this genus is known; its relations are discussed in the remarks on *Latridopsis*.

1862.]

LATRIS HECATEIA Rich.

Latris hecateia Rich., Proc. Zoological Society of London 1839, p. 98 ;
Trans. Zool. Soc., vol. iii. p. 106, pl. 6, fig. 1.

Cheilodactylus hecateius Rich., Proc. Zool. Soc. 1850, p. 67.

Habitat. Van Diemen's Land.

MENDOSOMA Gay.*Synonymy.*

Mendosoma Gay, Historia Fisica y Politica de Chili, *Zoologia*, tomo ii., p. 212, 1848.

Mendosoma Günther, Catalogue of the Acanthopterygian Fishes, &c., vol. ii., p. 83.

Dentes maxilla superiori solum.

Body fusiform, highest above or behind the ventral fins, with a slender caudal peduncle. Scales of moderate size. Head rather small, much compressed, acutely conical in profile, slightly depressed above the eyes. Eyes large; pupil intersected by the rostro-opercular line. Scales covering the head on the sides and above. Preoperculum angulated, with posterior margin vertical. Mouth moderate; jaws subequal. Teeth small and pluriserial, present only on the upper jaw. Branchiostegal rays six. Dorsal unequally divided, the spinous being longer than the soft, convex and highest in front of the middle, and sustained by about twenty-two spines; soft portion much higher than the last spines. Anal fin oblong, and little shorter than the soft dorsal, with its three spines moderate and the eighteen rays gradually decreasing. Pectoral fins rounded and with none of the rays produced.

Type. *Mendosoma lineatum* Gay.

Mendosoma is the only known representative of the Cirrhitoids in which the teeth are confined to the upper jaw. The physiognomy is somewhat similar to that of *Chirodactylus* or *Goniistius*, but from both of them it differs especially by the length and nearly uniform height of the anal fin and the less produced simple rays of the pectoral fins.

Three forms have been described as so many species, but the only clear characters are those relating to the colors. Whether the difference of coloration is not only one of degree and has not been exaggerated remains to be discovered. The diagnostic phrases below inserted are extracted from Gay's work.

MENDOSOMA LINEATUM (Gay.)

Mendosoma lineata Gay, Historia Fisica y Politica de Chile, *Zoologia*, tomo ii., p. 212, lam. 5, fig. 2.

M. corpore oblongo; dorso et lateribus virescentibus, lineis fuscis longitudinalibus; ventre pallide albo; pinnis fuscis, caudali solum nigro-maculatis emarginata.

D. XXII. I. 24. A. III. 18.

Habitat. Coast of Chili.

MENDOSOMA CÆRULESCENS Gay.

Mendosoma cærulescens Gay, op. cit., p. 215.

M. corpore elongato; supra cæruleo, infra cinereo, ita pinnis omnibus.

Habitat. Coast of Chili.

MENDOSOMA FERNANDEZIANUM (Gay.)

Mendosoma fernandezianus Gay, op. cit., p. 216.

M. corpore subovata, supra subgriseo, infra argentata; pinnis omnibus nigrescentibus; lateribus lineis fuscis distinctis,

Habitat. Coast of the Island of Juan Fernandez.

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DACTYLOSPARUS Gill.

*Synonymy.*Sparus sp. *Parkinson.*Cheilodactylus sp. *Cuv. et Val., Richardson.*Chilodactylus sp. *Günther.*

Body highest and arched above the ventral fins, convex behind, and with the caudal peduncle very slender. Scales of moderate size. Head moderate, with the crown arched and the profile much decurved. Eyes elevated above the rostro-opercular line and nearer the nape than the snout; preorbital bones very high; cheeks scaly. Preoperculum vertical behind, and with its angle broadly rounded. Mouth moderate. Teeth villiform on each jaw, preceded by a row of larger conical ones. Branchiostegal rays 6, 6. Dorsal fin with its spinous and soft portions nearly equally long and high; the former is convex near the middle, and scarcely lower than the soft part behind, with seventeen spines. Anal fin oblong, with its three spines moderate, and its soft rays subequal. Pectoral fins with one of its simply articulated rays much produced.

Type. *Dactylosparus carponemus* Gill.*Syn.* *Cheilodactylus carponemus* *Cuv. et Val.*

Dactylosparus has quite a different aspect from most of the Latridinae, and, as the new name indicates, has a considerable analogical resemblance to a Sparoid, the head being high and much decurved from the nape. The anal fin of the typical species at least has considerably more numerous rays than that of most of the allied genera, and the dorsal is nearly entire. Perhaps the type may be the only known species.

DACTYLOSPARUS CARPONEMUS Gill.

Sparus carponemus *Parkinson* MSS.*Cheilodactylus carponemus* *Cuv. et Val.*, Hist. Nat. des Poissons, tome v. p. 362, pl. 128.

D. XVII. 31. A. III. 19. P. 17.

Habitat. Coasts of Australia and New Zealand.

A fish found at Van Diemen's Land was at first referred to the *Cheilodactylus carponemus* of *Cuv. et Val.* as a variety by Sir John Richardson, but was afterwards distinguished as a peculiar species, under the name of *C. aspersus*. It is certainly very distinct, and indeed scarcely appears to be congeneric with the *C. carponemus*, differing from it in the short anal, the much stronger spines and the decided notch between the spinous and soft portions of the dorsal fin as well as by the elevated preorbital bones. The *Cheilodactylus macropterus* of Richardson appears to be most nearly related to his *C. aspersus*. In the present condition of our knowledge we will not venture to propose a distinct genus, but simply enumerate them in an appendix to *Dactylosparus*, under the names bestowed on them by Richardson.

CHEILODACTYLUS ASPERSUS Richardson.

Cheilodactylus carponemus *Richardson*, Transactions of the Zoological Society of London, vol. iii. p. 99.Not *Cheilodactylus carponemus* *Cuv. et Val.*, from whom, however, the radial formula is copied.*Cheilodactylus aspersus* *Richardson*, Proc. Zoological Society, 1850, p. 64.D. XVIII. 27. A. III. 11. P. 8 | 7. Scales 55—57 $\frac{6}{15}$. (B. 6.)*Habitat.* Van Diemen's Land.

CHEILODACTYLUS MACROPTERUS Richardson.

Sciæna macroptera *Forster.**Cichla macroptera* *Bloch*, Systema Ichthyologiæ, Schneid. ed., p. 342.*Cheilodactylus macropterus* *Richardson*, Proc. Zoological Society, 1850, p. 62.

D. XVII. 26. A. III. 14. P. 9 | 6. Scales $55 \frac{6}{17}$ Günther. (B. 6.)
Habitat. Australia (Port Arthur, Port Essington) and New Zealand.

CHILODACTYLUS (Lacépède.)

Chilodactylus Lacépède, Histoire Naturelle des Poissons, tom. v. p. 6.

Trichopterus Gronovius, Catalogue of Fish collected and described by L. T. Gronow, now in the British Museum, p. 162, 1854.

Cynædus sp. *Gronovius*, Zoophylacium.

Pteronemus Van der Haeren, Handbook of Zoology, vol. ii. p. 177.

Ossa branchiostegalia 5—5.

Body highest and arched above the ventral fins, and with a moderate caudal peduncle. Scales small. Head moderate, apparently with the crown arched and the profile decurved; crown and sides of the head scaly. Preoperculum vertical behind. Operculum with two blunt points separated by an emargination. Mouth moderate. Teeth on both of the jaws villiform. Branchiostegal rays five on each side. Dorsal fin with its spinous and soft parts nearly equal in length; the former has eighteen or nineteen spines, is convex near the middle, and little lower behind than the soft part. Anal fin short, with its three spines moderate and its soft rays rapidly diminishing in length. Pectoral fins with one of the articulated rays much produced.

Type. *Chilodactylus fasciatus Lacépède*.

The genus *Chilodactylus*, as now characterized, is distinguished by the form of the head and the presence of only five branchiostegal rays. Its scales are also in the type rather smaller than those of the allied genera. There is perhaps not more than one species.

CHILODACTYLUS FASCIATUS *Lacépède*.

Cynædus sp. *Gronov.*, Zoophylacium p. 64, No. 221, pl. x. fig. 1.

Chilodactylus fasciatus Lacépède, Hist. Nat. des Poissons, tom. v. p. 6, pl. 1, fig. 1.

Trichopterus indicus Gronovius, Catalogue, *Gray* ed. p. 162.

Pteronemus fasciatus Van der Hoeven, Handbook of Zoology vol. ii. p. 177. D. XVIII. 23. A. III. 11. Scales 75.

Hab. Cape of Good Hope.

The following species may provisionally be retained here; it differs from *Chilodactylus fasciatus* by the larger size of the scales and the brevity of the simple pectoral rays.

Chilodactylus brachydactylus Cuv. et Val.

Cheilodactylus brachydactylus Cuv. et Val., Hist. Nat. des Poissons, tome v. p. 361.

(B. V.) D. XVII.—XVIII. 31. A. III. 9. Scales 50 6-13.

Hab. Cape of Good Hope.

A species discovered in King George's Sound has been described as approaching to *C. carponemus* in shape, but rather more elongated in the body, and with a more arched spinous dorsal, the situation of the eyes nearer the snout, the abbreviated simple pectoral rays and the naked cheeks. "The disk of the preoperculum is broad, that of the interoperculum fully equal to it, and both these bones and the cheeks are scaleless in the specimen, which has sustained some damage in the head, but not apparently in these places," (Richardson.) If the cheeks are really naked in a normal condition, the species is so distinguished from every other species of the group of Latrides. It doubtless does not belong to the genus, but it cannot well be characterized until better known. Perhaps the *Cheilodactylus brachydactylus* belongs to the same genus.

CHILODACTYLUS NIGRICANS.

Cheilodactylus nigricans Richardson, Proc. Zoological Society 1850, p. 63.

Hab. Australia.

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ACANTHOLATRIS Gill.

Synonymy.

Chaetodon sp. *Carmichæl.*

Cheilodactylus sp. *Cuv. et Val., &c.*

Chilodactylus sp. *Günther.*

Caput conicum. Pinna analis *oblonga* spinis tribus robustis et radiis circa duodecim paulo decrecentibus.

Body oblong and subfusiform, highest above the ventral fins, and with the caudal peduncle slender. Scales moderate or large. Head rather small, conical and with the profile nearly straight. Eyes mostly above the rostro-opercular horizon, and nearly intermediate between the snout and nape. Preoperculum subvertical behind. Mouth small. Jaws nearly equal. Lips thick. Teeth pluriserial in each jaw. Branchiostegal rays six. Dorsal fin with its spinous portion rather longer than the soft, arched and with about seventeen stout spines, as high or higher than the soft dorsal. Anal fin oblong, with three robust spines and twelve rays which very slowly diminish in length. Pectoral fin with a simple ray considerably produced.

Type. *Acantholatrís monodactylus* Gill.

This genus is distinguished by the nearly uniform height of the anal, the strong spines of the dorsal and anal and the conical head. It appears to be most nearly allied to *Chirodactylus* and *Chilodactylus*, but differs especially from the first in the development of the anal fin and the strength of the spines, and from the second by the larger scales and the presence of six branchiostegal rays.

The only species of the genus that is well known is the one described by Carmichæl in his treatise on the Fishes of Tristan d'Acunha.

ACANTHOLATRIS MONODACTYLUS Gill.

Chaetodon monodactylus *Carmichæl*, Transactions of the Linnæan Society, vol. xii, p. 300, pl. 21.

Cheilodactylus *Carmichælis* *Cuv. et Val.*, Hist. Nat. des Poissons, tome v. p. 360; *ib.* tome ix. p. 489.

Cheilodactylus *Carmichælis* *Cuv.* Regne Animal, ed. ill., Poissons, pl. 31, fig. 2.

Chilodactylus monodactylus *Günther*, Catalogue of the Acanthopterygian Fishes, &c., vol. ii. p. 81.

Hab. Coast of Chili.

CHIRODACTYLUS Gill.

Synonymy.

Chilodactylus auct.

Caput conicum. Pinna analis ad angulum anticum multo producta, spinis tribus et radiis 7—10.

Body highest above the ventral fins, declining quite rapidly towards the slender caudal peduncle. Scales of moderate size. Head rather small, much compressed, presenting in profile a conical appearance, with the profile oblique and nearly straight. Eyes on or just above the rostro-opercular line, and mostly anterior. Cheeks and crown scaly. Preoperculum extended below, with the posterior margin vertical. Mouth small. Lower jaw shorter than the upper. Lips well developed. Teeth on each of the jaws pluriserial in front. Branchiostegal rays 6—6. Dorsal fin with its spinous and soft portions nearly equally long. The former is convex and highest near the middle, and much lower behind than the soft part. Anal fin short, with its three spines moderately produced at its anterior angle and rapidly diminishing behind, so that the rayed margin is nearly vertical. Pectoral fins with one of the simply articulated rays moderately produced.

1862.]

Type. Chirodactylus Antonii Gill.

This genus differs chiefly from *Chilodactylus* by the form of the head and the presence of six branchiostegal rays.

Chirodactylus is distinguished by the conical head, the convex outline of the spinous portion of the dorsal fin and the form of the anal. Two species are known of the genus; a third, described by Dr. Günther, is provisionally referred to it, which differs from the first two by the depth of the preorbital bones and the consequent position of the eyes and the brevity of the third anal spine. It appears to have the form of the anal characteristic of the genus, the length of the second soft anal ray equalling three inches three lines in a fish twenty seven inches long. The species may be thus distinguished.

Synopsis.

Eye nearer the snout than the end of the operculum.

Anal fin III. 7 *C. antonii*.

Anal fin III. 10 *C. variegatus*.

Eye rather nearer the end of operculum than to the snout.

Anal fin III. 9 *C. grandis*.

The typical species of the genus are inhabitants of the Chilian seas, while the *C. grandis* is a native of the Southern African seas.

CHIRODACTYLUS ANTONII Gill.

Chilodactylus antonii Cuv. et Val., Hist. Nat. des Poissons, tome ix. p. 494.

Hab. Chili.

CHIRODACTYLUS VARIEGATUS Gill.

Chilodactylus variegatus Cuv. et Val., Hist. Nat. des Poissons, tome ix. p. 494.

Chilodactylus tschudii Müll. et Troschel, Horæ Ichthyologicæ vol. iii. p. 25.

Chilodactylus cinctus Tschudii, Fauna Peruviana. Ichthyologia, p. 15, taf. 2.

Hab. Chili and Peru.

CHILODACTYLUS GRANDIS Günther.

Chilodactylus grandis Günther, Catalogue of the Acanthopterygian Fishes, &c., vol. ii. p. 79.

*GONIISTIUS Gill.**Synonymy.*

Chilodactylus sp. auct.

Pteronemus sp. Van Der Hoeven.

Pinna dorsalis spinis primis tribus parvis, quarto elongata; postice incurvata.

Body highest before the ventral fins, declining rapidly under the second dorsal to the slender caudal peduncle; ante dorsal region obliquely convex and carinated. Scales of moderate size. Head rather small, much compressed, with the profile oblique and nearly straight or slightly incurved. Old individuals have a pair of tubercles on the forehead and another on the snout. Eyes below, nearly on a line with the posterior termination of the operculum or suboperculum. Cheeks and crown scaly. Preoperculum posteriorly vertical and entire. Operculum spiniform behind and deeply emarginated above. Mouth small. Lower jaw shorter and received within the upper. Lips well developed and free. Teeth on each of the jaws, pluriserial in front, uniserial on the sides. Branchiostegal rays six on each side. Dorsal fin with its spinous and soft portions nearly equally long; the former has about seventeen spines, the first three of which are very small and graduated; the fourth is longest, and the outline behind is slightly incurved towards the soft part; the latter is of a nearly uniform height, exceeding the last spinous rays. Anal fin short, nearly under the middle of the soft portion of the dorsal, provided with three small spines produced at its anterior angle, and with about eight or nine

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rays, the posterior of which rapidly diminish in length, so that the rayed margin is subvertical. Pectoral fins with the simply articulated inferior rays moderate, and moderately elongated.

Type. *Goniistius zonatus* Gill.

This genus is proposed for species of Oriental and Australian fishes that have been referred by previous naturalists to the genus *Chilodactylus*, from which they appear to differ sufficiently to authorize their separation. They are readily distinguished from all the other *Chilodactyli* of Cuvier by the structure and outline of the dorsal fin, the size and form of the head, and the entire physiognomy. They agree with the *Chirodactyli* in the form of the anal fin.

Three species have been described, one of which has been long known and is now taken as the type of the genus. The most distinctive characters of the respective species are exhibited in the following analytical table :

Body with 7 to 10 *oblique* bands.

Head not banded, unicolor.	Scales 60 ————— 9	<i>G. zonatus</i> .
	16	

Head with a nearly vertical band below the eye. Scales

9	54 —————	<i>G. quadricornis</i> .
17		

Body with a blackish longitudinal band on the back ascending to the apex of the spinous dorsal; bands on and behind the head. Scales 63..... *G. gibbosus*.

1. *GONIISTIUS ZONATUS* Gill.

Chilodactylus zonatus Cuv. et Val., Hist. Nat. des Poissons, tome v. p. 363, pl. 129.

Chilodactylus zonatus Günther, Catalogue of the Acanthopterygian Fishes, &c. vol. ii. p. 82.

Hab. Japanese and Chinese seas.

2. *GONIISTIUS GIBBOSUS* Gill.

Chilodactylus gibbosus Richardson, Proc. of the Zoological Society of London 1850, p. 65, pl. 2, figs. 3, 4.

Hab. Coast of West Australia.

3. *GONIISTIUS QUADRICORNIS* Gill.¹

Chilodactylus quadricornis Günther, Catalogue of the Acanthopterygian Fishes, vol. ii. p. 83.

Hab. Sea of Japan.

Group *NEMATODACTYLI* Gill.

LATRIDINÆ radiis branchiostegalibus tribus; caput plerumque nudum.

Branchiostegal rays three. Head mostly or entirely naked.

NEMATODACTYLUS (Richardson.)

Synonymy.

Nemadactylus Richardson, Proceedings Zoological Society, 1839, p. 98; *Id.* Transactions of the Zoological Society, vol. iii. p. 116.

Dentes maxillis uniseriati, parvi.

Body robust, fusiform, highest behind the ventral fins. Scales thin and of moderate size. Head rather small, with the outlines above and below slightly curved to the snout. Eyes mostly anterior, on or scarcely above the rostro-opercular line. Crown and forehead only scaly; cheeks and opercula naked. Opercular bones unarmed. Preoperculum nearly vertical behind. Teeth 1862.]

uniserial on each jaw. Branchiostegal rays only three on each side. Dorsal fin nearly equally divided; its spinous portion convex and with seventeen spines, the last of which are lower than the second part. Anal fin oblong, with three moderate spines and about fifteen gradually decreasing rays. Pectoral fins with one of its simple rays produced beyond the rest.

The genus *Nematodactylus* is distinguished from all the other representatives of the family by the presence of only three branchiostegal rays. Notwithstanding this anomalous character, its resemblance to the Latridinæ, and especially to *Chiredactylus* and the allied genera, is such that scarcely a doubt can be entertained as to the affinity of the genus to the rest of the subfamily. Another characteristic feature of the genus is the nudity of the cheeks.

Only one species is known.

NEMATODACTYLUS CONCINNUS (Rich.)

Nematodactylus concinnus Richardson, Transactions of the Zoological Society, vol. iii. p. 116, pl. 4, fig. 2.

Habitat. Port Arthur, Van Diemen's Land.

Description of a new species of *CIRRHITUS*.

CIRRHITUS ALTERNATUS Gill.

The form is similar to that of the typical species of the genus. The region of greatest height is above the ventral fins, and there equals three-tenths (3-10) of the total length; thence the back is slowly decurved towards the caudal peduncle; the height behind the dorsal equals an eighth and that at the lowest part of the peduncle a tenth of the length. The thickness at the pectoral region is between a fifth and sixth of the length.

The head is very obliquely decurved, and is longer than high; it nearly equals the height (29-100) to the end of the bony projection of the operculum, and the membranous portion extends two fractions beyond (31-100.) The distance from the snout to the nape equals 23-100 of the total length, and is as great as the height at the latter region; the height at the pupil equals 18-100 of the length. The interorbital region is channelled or concave. The distance between the orbital ridges is less than the diameter of the eye ($4\frac{1}{2}$ -100.) The eye is moderate, the diameter being nearly a fourth of the head's length (7-100 of the total), and is greater than the height of the preorbital, which is about a fifth of the head's length (6-100.) The snout exceeds a third of the same (11-100.) The preoperculum has a convex margin, which is delicately serrated above the interoperculum. The preorbital is entirely concealed in the integuments and entire, and equals in height the diameter of the eye. The cheeks are covered with very small scales; the preopercular border naked; the operculum and suboperculum have three rows of scales, larger than those of the body; the interoperculum three in one row; the operculum two in the lower row and two smaller ones in an upper. The postnasal fringe has two larger filaments and several smaller ones.

The cleft of the mouth has a semi-elliptical contour, and is moderate, the supramaxillary bones ending under the posterior border of the pupil. The canine teeth are well developed, two being in the front of the upper towards the sides, and six to eight in the lower in front, while on each side of the lower are also two larger ones. The band of villiform teeth is quite broad in each jaw. The front of the vomer only has a narrow lambdoidal band, and the palatines are unarmed.

The dorsal fin commences over the end of the bony operculum and the axilla of the pectoral, or nearly with the third tenth (32-100) of the total length. The spinous portion covers three-tenths (31-100) of the length, and is convex; the first spine equals a twentieth (5-100) of the total length, and is less than half as long as the third to the sixth inclusive, they equalling a ninth (11-100) of

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